

General

Title

Occupational health: annual number of incident cases of blood lead level greater than or equal to 25 µg/dL for residents age 16 years or older.

Source(s)

Council of State and Territorial Epidemiologists (CSTE), National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention (CDC). Occupational health indicators: a guide for tracking occupational health conditions and their determinants. Atlanta (GA): Council of State and Territorial Epidemiologists (CSTE); 2016 Mar. 145 p.

Measure Domain

Primary Measure Domain

Related Population Health Measures: Population Health State

Secondary Measure Domain

Related Population Health Measure: Environment

Brief Abstract

Description

This measure is used to assess the annual number of incident cases of blood lead level greater than or equal to 25 µg/dL for residents age 16 years or older.

Rationale

State health agencies, which are vested with the legal authority to require disease reporting and collect health data, play a central role in public health surveillance. Whereas public health surveillance was once focused primarily on infectious diseases, it has expanded in recent years to include surveillance of a wide range of health outcomes and their determinants, including chronic diseases, injuries and health behaviors (Halperin & Horan, 1998). National statistics on occupational injuries and illnesses have been collected largely outside of the public health infrastructure and rely almost entirely on data reported by employers. State health agencies that have access to a wide variety of public health data systems have

an important role in the surveillance of occupational diseases, injuries and hazards.

Among adults, lead poisoning is a persistent, mainly occupational, health issue that continues to be an important public health problem. The most widely available test for exposure is the blood lead level (BLL). The Federal Occupational Safety and Health Administration (OSHA) lead standards to protect workers from lead associated health effects include requirements for monitoring BLLs among employees who meet certain exposure criteria. The standards are based on medical information that is more than 30 years old and are not protective against the adverse health effects of lead. Lower medical removal recommendations have been proposed to protect workers against the adverse health effects of both acute and cumulative lead exposures. It is important to note that the average BLL for the general population is less than 1.5 µg/dL.

Evidence for Rationale

Council of State and Territorial Epidemiologists (CSTE), National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention (CDC). Occupational health indicators: a guide for tracking occupational health conditions and their determinants. Atlanta (GA): Council of State and Territorial Epidemiologists (CSTE); 2016 Mar. 145 p.

Halperin W, Horan JM. Surveillance of injuries. Public Health Rep. 1998 Sep-Oct;113(5):424-6. [PubMed](#)

Primary Health Components

Occupational exposures; elevated blood lead level (BLL)

Denominator Description

Employed population age 16 years or older for the same calendar year

Numerator Description

All reported state residents age 16 years or older with a blood lead level of greater than or equal to 25 µg/dL (see the related "Numerator Inclusions/Exclusions" field)

Evidence Supporting the Measure

Type of Evidence Supporting the Criterion of Quality for the Measure

A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences

One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

Additional Information Supporting Need for the Measure

Since November 2015, the surveillance case definition for an elevated blood lead level (BLL) used by the Centers for Disease Control and Prevention (CDC) and National Institute of Occupational Safety and Health (NIOSH) includes workers age 16 and older, with blood lead concentrations of greater than or equal to 5 µg/dL (greater than or equal to five micrograms per deciliter) of whole blood, in a venous blood

sample. This case definition is used by the Adult Blood Lead Epidemiology and Surveillance (ABLES) program, the Council of State and Territorial Epidemiologists (CSTE), and CDC's National Notifiable Diseases Surveillance System (NNDSS). In 2010, the CDC included, for the first time, elevated BLLs defined as a blood lead concentration greater than or equal to 10 µg/dL, as a Nationally Notifiable Non-Infectious Condition. The U.S. Department of Health and Human Services recommends that BLLs among all adults be reduced to less than 10 µg/dL. In 2012, a total of 41 states submitted data on 7,529 adults with BLLs greater than or equal to 25 µg/dL and 38 states submitted data on 27,218 adults with BLLs greater than or equal to 10 µg/dL. Overall, the national prevalence of BLLs greater than or equal to 10 µg/dL declined from 26.6 adults per 100,000 employed in 2010 to 22.5 in 2012. The national prevalence of BLLs greater than or equal to 25 µg/dL declined from 14.0 adults per 100,000 employed in 1994 to 5.7 in 2012. In 2012, state prevalence rates of BLLs greater than or equal to 25 µg/dL were above the national rate (5.7/100,000) in 10 states and state prevalence rates of BLLs greater than or equal to 10 µg/dL were above the national rate (22.5/100,000) in 12 states. Historically, in the United States, most lead exposures have been occupational. During 2002 to 2012, the annual proportion of BLLs greater than or equal to 25 µg/dL from occupational exposures was 94.7% among participating states (minimum: 93.3% in 2012; maximum: 95.5% in 2004). In 2012, among the 37 states that reported the exposure source for adults with BLLs greater than or equal to 25µg/dL, the proportion of occupational cases by state ranged from 38.9% to 100%.

Many adults in the United States continue to have BLLs above levels known to be associated with acute and chronic adverse effects in multiple organ systems ranging from subclinical changes in function to symptomatic intoxication. These include neurologic, cardiovascular, reproductive, hematologic, and kidney adverse effects. The risks for adverse chronic health effects are even higher if the exposure is maintained for many years. Current research has found decreased renal function associated with BLLs at 5 µg/dL and lower, and increased risk of hypertension and essential tremor at BLLs below 10 µg/dL. Children also suffer the adverse effects of lead and about 24,000 United States children with BLLs of 10 µg/dL or greater are estimated to be exposed from lead unintentionally brought home by a parent from the workplace. Pediatric effects include neurologic damage, learning disabilities, and behavior problems.

Evidence for Additional Information Supporting Need for the Measure

Council of State and Territorial Epidemiologists (CSTE), National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention (CDC). Occupational health indicators: a guide for tracking occupational health conditions and their determinants. Atlanta (GA): Council of State and Territorial Epidemiologists (CSTE); 2016 Mar. 145 p.

Extent of Measure Testing

In 1998, the Council of State and Territorial Epidemiologists (CSTE), in association with the National Institute for Occupational Safety and Health (NIOSH), convened the NIOSH-States Occupational Health Surveillance Work Group to make recommendations to NIOSH concerning State-based surveillance activities for the coming decade.

The Work Group recognized the need to pilot test 19 indicators to assess the feasibility of widespread implementation and to develop specific guidance on how to compute the proposed measures. In summer 2002, the five "Core" states with NIOSH Cooperative Agreements to conduct "Core Occupational Health Surveillance" (California, Massachusetts, Michigan, New York, and Washington) agreed to pilot test the indicators and to create user-friendly "how-to" guides so that other states could calculate the indicators.

Subsequent to the initial pilot testing by the five "Core" states, eight additional states (Connecticut, Maine, Nebraska, New Jersey, New Mexico, North Carolina, Oregon and Wisconsin) pilot tested the "how-to" guides. Feedback from these additional states was incorporated into the development of the final "how-to" guides for 19 indicators in November 2004.

Procedures to review, approve, and implement new indicators were developed by the Work Group. In 2013, a fourteenth health effect indicator (*Asthma among Adults Caused or Made Worse by Work*) was developed and pilot tested. The Work Group voted to adopt this as the twenty-first indicator. In 2014, a fifteenth health effect indicator (*Work-Related Severe Traumatic Injury Hospitalizations*) was developed and pilot tested. The Work Group voted to adopt this as the twenty-second indicator.

Evidence for Extent of Measure Testing

Council of State and Territorial Epidemiologists (CSTE), National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention (CDC). Occupational health indicators: a guide for tracking occupational health conditions and their determinants. Atlanta (GA): Council of State and Territorial Epidemiologists (CSTE); 2016 Mar. 145 p.

State of Use of the Measure

State of Use

Current routine use

Current Use

not defined yet

Application of the Measure in its Current Use

Measurement Setting

National Public Health Programs

State/Provincial Public Health Programs

Professionals Involved in Delivery of Health Services

not defined yet

Least Aggregated Level of Services Delivery Addressed

State/Provincial

Statement of Acceptable Minimum Sample Size

Specified

Target Population Age

Age greater than or equal to 16 years

Target Population Gender

Either male or female

National Framework for Public Health Quality

Public Health Aims for Quality

Population-centered

Risk Reducing

Transparency

Vigilant

National Strategy for Quality Improvement in Health Care

National Quality Strategy Priority

Institute of Medicine (IOM) National Health Care Quality Report Categories

IOM Care Need

Not within an IOM Care Need

IOM Domain

Not within an IOM Domain

Data Collection for the Measure

Case Finding Period

The calendar year

Denominator Sampling Frame

Geographically defined

Denominator (Index) Event or Characteristic

Geographic Location

Patient/Individual (Consumer) Characteristic

Denominator Time Window

not defined yet

Denominator Inclusions/Exclusions

Inclusions

Employed population age 16 years or older for the same calendar year

Exclusions

Unspecified

Exclusions/Exceptions

not defined yet

Numerator Inclusions/Exclusions

Inclusions

All reported state residents age 16 years or older with a blood lead level of greater than or equal to 25 µg/dL

Note: Refer to the "How-To Guide – Indicator #13" section of the original measure documentation for instructions to calculate the annual number of incident cases: blood lead level greater than or equal to 25 µg/dL.

Exclusions

Events with out-of-state residents

Numerator Search Strategy

Fixed time period or point in time

Data Source

Laboratory data

National public health data

State/Province public health data

Type of Health State

Adverse Health State

Instruments Used and/or Associated with the Measure

Unspecified

Computation of the Measure

Measure Specifies Disaggregation

Does not apply to this measure

Scoring

Count

Interpretation of Score

Does not apply to this measure (i.e., there is no pre-defined preference for the measure score)

Allowance for Patient or Population Factors

not defined yet

Description of Allowance for Patient or Population Factors

Other Available Data: Age, gender, industry, occupation, individual blood lead level (BLL), and all lead test reports (i.e., not just those exceeding the specified criteria)

Recommendations: Because adverse health effects can begin at BLLs below 10 µg/dL, it is recommended that states also calculate the number and rate of elevated BLLs at 5 µg/dL. In addition, many states have data elements that can be used to better define the pattern of elevated BLLs. Report numbers and rates for occupational cases only, rather than including both occupationally and non-occupationally exposed persons in the numerator. Include occupationally exposed cases working in your state (e.g., employer is based in your state, or, if able to determine, worksite is in your state), regardless of their state of residence. Age, gender, and race/ethnicity specific counts and rates can be used to better define the pattern of elevated BLLs. Industry and occupation information can be used to provide additional insight. Individual BLLs can help identify particularly egregious exposures. Follow-up of selected cases and/or clusters can help identify where/how individuals with high BLLs were exposed. Obtaining reports on all BLLs can provide insight about the overall frequency of BLL testing, and allow follow-up of employers not doing required testing.

Standard of Comparison

not defined yet

Identifying Information

Original Title

13.2.3 Annual number of incident cases: blood lead level \geq 25 µg/dL.

Measure Collection Name

Occupational Health Indicators

Measure Set Name

Occupational Exposures

Submitter

Council of State and Territorial Epidemiologists - Professional Association

Developer

Centers for Disease Control and Prevention - Federal Government Agency [U.S.]

Council of State and Territorial Epidemiologists - Professional Association

Funding Source(s)

Centers for Disease Control and Prevention (CDC)–National Institute for Occupational Safety and Health (NIOSH) Award 2-R01 OH010094-05: Enhancing State-Based Occupational Health Surveillance Capacity

Composition of the Group that Developed the Measure

Original Work Group Members: National Institute for Occupational Safety and Health (NIOSH)–Council of State and Territorial Epidemiologists (CSTE) Occupational Health Surveillance Work Group

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Tristan Victoroff, *Co-chair* (NIOSH Representative)
Patricia Schleiff, *Co-chair* (NIOSH Representative)
Amy Patel, *Secretary* (CSTE)
Susan Payne, *OHI Lead* (State Representative from California)

Financial Disclosures/Other Potential Conflicts of Interest

None

Adaptation

This measure was not adapted from another source.

Date of Most Current Version in NQMC

2016 Mar

Measure Maintenance

Annually

Date of Next Anticipated Revision

Unspecified

Measure Status

This is the current release of the measure.

This measure updates a previous version: Council of State and Territorial Epidemiologists (CSTE), National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention (CDC). Occupational health indicators: a guide for tracking occupational health conditions and their determinants. Atlanta (GA): Council of State and Territorial Epidemiologists; 2014 Mar. 116 p.

Measure Availability

Source available from the [Council of State and Territorial Epidemiologists \(CSTE\) Web site](#)

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For more information, contact CSTE at 2872 Woodcock Boulevard, Suite 250, Atlanta, GA 30341; Phone: 770-458-3811; Fax: 770-458-8516; Web site: <https://cste.site-ym.com/> .

NQMC Status

This NQMC summary was completed by ECRI Institute on March 3, 2015.

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Production

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Council of State and Territorial Epidemiologists (CSTE), National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention (CDC). Occupational health indicators: a guide for tracking occupational health conditions and their determinants. Atlanta (GA): Council of State and Territorial Epidemiologists (CSTE); 2016 Mar. 145 p.

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